MASTER OF SCIENCE
IN
APPLIED MATHEMATICS

REFINEMENTS IN A DISCRETE COSINE TRANSFORMATION BASED NON-UNIFORM EMBEDDING WATERMARKING SCHEME
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Perceptual watermarking is a promising technique towards the goal of producing invisible watermarks. It involves the integration of formal perceptual models in the watermarking process, with the purpose of determining those portions of an image that can better tolerate the distortion imposed by the embedding, and ensuring that the watermarking will inflict the least possible degradation on the original image. In a previous study, the Discrete Cosine Transform (DCT) was used and the watermark embedding was done in a non-uniform manner with criteria based on both the host image and the watermark. The decoder model employed made use of apriori access to unmarked and marked images, as well as to the watermark. A fair level of success was achieved in this effort. In this research, the scheme is refined by integrating a perceptual model and by proposing a modification to the decoder model that makes possible the successful recovery of the watermark without apriori access. The proposed perceptual scheme improves the watermark's transparency, while maintaining sufficient robustness to quantization and cropping. The proposed semi-blind variation offers adequate transparency and robustness to quantization, but its performance against cropping is considerably degraded.

KEYWORDS: Digital Image Watermarking, JPEG Compression, Discrete Cosine Transform, Perceptual Models, Human Visual System

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